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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/787,312	02/27/2004	Evgeni Gorovoy	8989-020	4353

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EXAMINER	
TAKAOKA, DEAN O	
ART UNIT	PAPER NUMBER
2817	

MAIL DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/787,312	GOROVOY ET AL.	
	Examiner	Art Unit	
	Dean O. Takaoka	2817	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 May 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 February 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 – 6 and 8 – 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Hettlage et al. (US 4,967,170) for reasons of record contained in the Office action dated January 12, 2007.

Claim 1.

Hettlage (Figs. 2 and 3) shows a microwave switch housing assembly for operation in a selected frequency range, comprising: a housing (1); a rotor (2) rotatably mounted within said housing; at least one waveguide passage in said rotor; said housing having ports formed therein (A-D) so that in a first position of said rotor, said waveguide passage (3-5) connects said ports and in a second position of said rotor, said waveguide passage is unconnected to said ports (Fig. 2); a power absorbing element located within one of said housing and said rotor (10-13 or 14-17) such that said power absorbing element is positioned adjacent to one end of said waveguide passage when said rotor is in said second position; said power absorbing element being capable of absorbing electromagnetic energy in said frequency range, so as to reduce the tendency of said waveguide passage to act as a volume resonator when said rotor is in said second position (where 10-13 or 14-17 are slits which are chokes and

attenuate crosstalk – c3, lns 40,41; where the slits are air cavities thus inherently where air comprises an absorbing material absorbing unwanted crosstalk signals).

Claim 2.

Wherein said housing has an interior opening to accommodate said rotor, said opening having a cylindrical surface (circular shape – abstract with respect to passages 4,5), said cylindrical surface having a channel therein adapted to house said power absorbing element.

Claims 3 and 8.

Wherein said waveguide passage has an end openings having a selected height and width, and said channel has substantially the same height and width as said selected height and width (where the term substantially is broad, thus where the channels of Hettlage has substantially the same height and width).

Claim 4.

Wherein said waveguide passage has two end openings, and wherein said power absorbing material is positioned in said housing adjacent to at least one of said end openings when said rotor is in said second position (where 14-17 are located in the housing and adjacent output openings).

Claims 5 and 10.

Wherein said channel has a cross-section selected from the group consisting of: rectangular, cylindrical, **and** triangular (where the channels are circular).

Claims 6 and 11.

Wherein said power absorbing element has a cross-section selected from the group consisting of: rectangular, cylindrical, **and** triangular (where the slits are rectangular).

Claim 9.

Wherein said waveguide passage has two end openings, and wherein said power absorbing material is positioned in said housing adjacent to at least one of said end openings when said rotor is in said second position (any two end openings A-D where the chokes are adjacent to each opening).

Claims 1 – 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Mayer (US 6,218,912) for reasons of record contained in the Office action dated January 12, 2007.

Claim 1.

Mayer (Fig. 3) shows a microwave switch housing assembly for operation in a selected frequency range, comprising: a housing (1); a rotor (2) rotatably mounted within said housing; at least one waveguide passage in said rotor; said housing having ports formed therein (11-14) so that in a first position of said rotor, said waveguide passage (7-9) connects said ports and in a second position of said rotor, said waveguide passage is unconnected to said ports (Fig. 3); a power absorbing element located within one of said housing and said rotor (4 or 5) such that said power absorbing element is positioned adjacent to one end of said waveguide passage when said rotor is in said second position; said power absorbing element being capable of

absorbing electromagnetic energy in said frequency range, so as to reduce the tendency of said waveguide passage to act as a volume resonator when said rotor is in said second position (where 4, 5 are grooves which improve electrical properties - c2, lns 24-27 and are analogous to the slits of Hettlage discussed above).

Claim 2.

Wherein said housing has an interior opening to accommodate said rotor, said opening having a cylindrical surface, said cylindrical surface having a channel therein adapted to house said power absorbing element (where the term cylinder does not preclude a rectangular shape shown in Fig. 2 of Mayer).

Claims 3 and 8.

Wherein said waveguide passage has an end opening having a selected height and width, and said channel has substantially the same height and width as said selected height and width (where the term substantially is broad, thus where the channels of Mayer has substantially the same height and width and shown in Fig. 2).

Claim 4.

Wherein said waveguide passage has two end openings, and wherein said power absorbing material is positioned in said housing adjacent to at least one of said end openings when said rotor is in said second position (where power absorbers all shown as 5 are located in the housing and adjacent output openings).

Claims 5 and 10.

Wherein said channel has a cross-section selected from the group consisting of: rectangular, cylindrical, **and** triangular (where the channels are rectangular).

Claims 6 and 11.

Wherein said power absorbing element has a cross-section selected from the group consisting of: rectangular, cylindrical, **and** triangular (where the slits are rectangular).

Claim 7.

Wherein said rotor has a plurality of curved outer surfaces, at least one of said curved outer surfaces having a channel therein adapted to house said power absorbing element (Fig. 3; where channel 5 connects to the curved outer surface of the housing).

Claim 9.

Wherein said waveguide passage has two end openings, and wherein said power absorbing material is positioned in said housing adjacent to at least one of said end openings when said rotor is in said second position (any two end openings 11-14 where the chokes are adjacent to each opening).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1 – 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Spinner (GB 2 250 140A), prior art cited by Applicants IDS dated July 8, 2005 in view of

Hettlage or Mayer for reasons of record contained in the Office action dated January 12, 2007.

Claim 1.

Spinner (Figs. 4-6) shows a microwave switch housing assembly for operation in a selected frequency range, comprising: a housing (1); a rotor (4) rotatably mounted within said housing; at least one waveguide passage in said rotor; said housing having ports formed therein (A-D); a power absorbing element located within one of said housing and said rotor (11-14 or 41, 42) such that said power absorbing element is positioned adjacent to one end of said waveguide passage when said rotor is in said second position; said power absorbing element being capable of absorbing electromagnetic energy in said frequency range, so as to reduce the tendency of said waveguide passage to act as a volume resonator when said rotor is in said second position (where 11-14 or 41,42 are slits or chokes which improve electrical properties – c3, paragraph 3; and are analogous to the slits of Hettlage discussed above) but does not show when the rotor is rotated in a first position of said rotor, said waveguide passage connects said ports and in a second position of said rotor, said waveguide passage is unconnected to said ports.

Both Hettlage and Mayer shows a nearly identical waveguide switch comprising three channels so that in a first position of said rotor, said waveguide passage connects said ports and in a second position of said rotor, said waveguide passage is unconnected to said ports.

It would have been obvious to one of ordinary skill in the art at the time the

invention was made to have modified the device disclosed by Spinner with the third channel disclosed by either Hettlage or Mayer. Such a modification would have been obvious and realized the advantageous benefit of providing an additional straight thru connection thus suggesting the obviousness of the modification.

Claim 2.

Wherein said housing has an interior opening to accommodate said rotor, said opening having a cylindrical surface, said cylindrical surface having a channel therein adapted to house said power absorbing element (where the term cylinder does not preclude a rectangular shape shown in Fig. 1 of Spinner).

Claims 3 and 8.

Wherein said waveguide passage has an end opening having a selected height and width, and said channel has substantially the same height and width as said selected height and width (where the term substantially is broad, thus where the channels of Spinner has substantially the same height and width and shown in Fig. 1).

Claim 4.

Wherein said waveguide passage has two end openings, and wherein said power absorbing material is positioned in said housing adjacent to at least one of said end openings when said rotor is in said second position (where power absorbers 11-14 are located in the housing and adjacent output openings).

Claims 5 and 10.

Wherein said channel has a cross-section selected from the group consisting of: rectangular, cylindrical, **and** triangular (where the channels are rectangular).

Claims 6 and 11.

Wherein said power absorbing element has a cross-section selected from the group consisting of: rectangular, cylindrical, **and** triangular (where Spinner shows rectangular, circular and cone shaped cavities).

Claim 7.

Wherein said rotor has a plurality of curved outer surfaces, at least one of said curved outer surfaces having a channel therein adapted to house said power absorbing element (Figs. 4 - 6; where the slits all connect to the curved outer surface of the housing).

Claim 9.

Wherein said waveguide passage has two end openings, and wherein said power absorbing material is positioned in said housing adjacent to at least one of said end openings when said rotor is in said second position (any two end openings A-D where the chokes are adjacent to each opening).

Response to Arguments

Applicant's arguments filed May 1, 2007 have been fully considered but they are not persuasive.

Claim Rejections - 35 USC § 102

Hettlage et al. –

Applicant's submit "*the slits (i.e. chokes) taught by Hettlage et al. (hereafter Hettlage) is directed towards a different purpose than the claimed subject matter of the subject application. The chokes taught by Hettlage are directed towards reducing cross-*

talk between the ports of his switch (see col. 2, lines 8-12 in the Summary of the Invention section and column 3, lines 40-45 in the Description section).

The use of such grooves acting as chokes has been acknowledged by the Applicant in the passage from line 28, page 2 to line 9, page 3 of the application as filed. In this passage, the Applicant notes that these prior art chokes that have been designed to reduce cross-talk are not effective at preventing resonance in these regions of the switch, which result in spurious narrow spikes. Further, the addition of these grooves adds to the complexity of the manufacturing cost of producing the housing assembly of the switch. The Applicant notes that there is no teaching in Hettlage of preventing such resonance nor an acknowledgement of this resonance problem.

In contrast, claim 1 of the subject application recites a microwave switch housing assembly for operation in a selected frequency range, comprising: a housing, a rotor rotatably mounted within said housing, and at least one waveguide passage in said rotor. The housing has ports formed therein so that in a first position of the rotor, the waveguide passage connects the ports and in a second position of the rotor, the waveguide passage is unconnected to the ports. Furthermore, claim 1 recites a power absorbing element located within one of the housing and the rotor such that the power absorbing element is positioned adjacent to one end of the waveguide passage when the rotor is in the second position. Claim 1 further recites that the power absorbing element is capable of absorbing electromagnetic energy in the frequency range, so as to reduce the tendency of the waveguide passage to act as a volume resonator when the rotor is in the second position.

In addition, the Applicant further submits that the process by which signals are attenuated by the chokes in Hettlage is different from the process by which resonance is prevented in the claimed subject matter. The chokes shown as elements 10-13 or 14-17 in Hettlage comprise a groove placed perpendicular to the leakage path such that a portion of the leaked signal enters the groove. Because the groove is a dead end path (i.e. a short circuit), this signal is reflected back into the gap with a calculated delay such that the reintroduced signal is in anti-phase to the primary leakage. The two superimposed signals then mutually cancel and leakage is suppressed. The chokes function optimally when as little energy as possible is absorbed in the choke, as absorption would diminish the capability of the choke to cancel remaining primary leakage. Accordingly, the chokes operate on the principle that air is almost transparent to radiofrequency signals, and therefore the air in the chokes cannot be characterized as a power absorbing element. In particular, Hettlage employs choke grooves that are narrow and deep to improve the impedance match with the leakage path (i.e. gap) ensuring strong coupling of the choke. The depth achieves the ¼ wavelength condition that is necessary to achieve ½ wavelength delay of the reflected signal.

In contrast, the power absorbing element recited in claim 1 is made of a material that is not transparent to the leakage signal, but rather absorbs the leakage signal. Accordingly, the leakage signal is attenuated through absorption, rather than reflection and superimposition of mutually canceling signals, to prevent resonance in this area of the switch from occurring."

The Examiner acknowledges the chokes of Hettlage are directed towards

reducing cross-talk. The Examiner further acknowledges Applicant's reference in the specification page 2, line 28 to page 3 line 9 where "*Another approach is to provide longitudinal and circumferential grooves on the surface of the rotor and/or by providing grooves on the inner surface of the housing. For example, in U.S. Patent Nos. 3,155,923 to Persson, 4,649,355 to Ullman, and 6,218,912 to Mayer, the isolation of unconnected ports can be improved using such methods and result in a ratio of even less than -60 dB. However, the use of such grooves on the inner surface of the housing does not appear in practice to eliminate the appearance of the spurious narrow spike. The inventors have determined that in practice, the spurious narrow spike still can have an amplitude in the range -35 to -40 dB. In addition, the provision of longitudinal and circumferential grooves adds to the complexity and manufacturing cost of producing housing assembly 10.*" As can be clearly understood, the grooves such as shown by Hettlage and analogous to the cited prior art does not appear to eliminate a spurious narrow spike, however it is the position of the Examiner that elimination of this spike is not commensurate with that which is being claimed. The specification describes spurious spikes still having some amplitude (i.e. –35 to – 40db) suggesting some degree of suppression by the grooves, albeit not elimination.

Applicant further remarks "*The chokes function optimally when as little energy as possible is absorbed in the choke, as absorption would diminish the capability of the choke to cancel remaining primary leakage. Accordingly, the chokes operate on the principle that air is almost transparent to radiofrequency signals, and therefore the air in the chokes cannot be characterized as a power absorbing element.*", thus where even

though air being "*almost transparent*" nonetheless is capable of some degree of absorption and where the absorbing material is not clearly defined, either by property (e.g. ferrite) or by range (i.e. limits of absorption), thus is at best generically claimed which does not patentably distinguish over the prior art of record. It is the position of the Examiner that the "air" grooves or chokes of Hettlage absorb some degree of the electromagnetic energy where the absorbing material is not defined, either by property (e.g. ferrite) or by range, thus the claims remain anticipated by Hettlage and the rejections is/are maintained.

Mayer –

Mayer shows the most nearly identical device as Hettlage comprising "air chokes" thus for the same reasons have the same functionality where the "air" grooves or chokes of Mayer absorb some degree of the electromagnetic energy where the absorbing material is not defined, either by property (e.g. ferrite) or by range, thus the claims remain anticipated by Mayer and the rejections is/are maintained.

Claim Rejections - 35 USC § 103

Spinner in view of Hettlage et al. or Mayer –

Applicant's submit "*In response, the Applicant respectfully submits that similar distinctions to those that were made between claim 1 of the subject application and the subject matter of the Mayer and Hettlage can also be made for the subject matter of Spinner. Firstly, while in some embodiments, the chokes taught by Spinner contain a lossy, capacitive or dielectric substance, the chokes are nevertheless designed to*

attenuate the signals by working in pairs to reflect and cancel the signals. The modifications taught by Spinner are used to more effectively place chokes in the available space, but Spinner does not deviate from their functionality as chokes. Further, Spinner does not teach that the lossy, capacitive or dielectric substances are capable of attenuating the signals by absorbing them. Rather, Spinner uses the dielectrics to reduce choke size, but this diminishes impedance match. Also, the use of the dielectrics is such that the structures taught by Spinner still satisfy the choke functionality.

Furthermore, as the switch shown in Spinner does not have an unconnected waveguide passage in any operating configuration, it follows that the chokes are designed to isolate ports, and are not designed to prevent an unconnected waveguide passage from acting as a volume resonator.

In addition, if one were to add an extra waveguide passage to the Spinner device this introduces the resonance problem, which neither exists nor is addressed in Spinner. Furthermore, the added waveguide would replace the rotor portion of Spinner's ½ wave choke, thereby creating a ¼ wave single choke. Insofar as Spinner's creative geometries are based on ½ wave structures, their functionality and the substance of the disclosure are compromised if another waveguide is added."

Spinner also comprises "air" chokes as well as added lossy dielectric material. From the discussion of Hettlage and Mayer above, the grooves or chokes of Spinner absorb some degree of the electromagnetic energy where the absorbing material is not defined, either by property (e.g. ferrite) or by range. Furthermore, Spinner although

does not show a central waveguide comprising the alternate switching function as claimed, by the showing of the nearly identical devices of Hettlage and Mayer, the modification of a central waveguide passage would have been obvious.

Applicant's arguments with respect to the substitution of the third waveguide are not persuasive. Both Hettlage and Mayer show chokes incorporated into the three channel waveguides switches. Spinner merely adds an additional lossy dielectric material as an extension of the choke. Clearly any of the chokes of Hettlage or Mayer could have been adopted to incorporate the additional lossy dielectric material of Spinner and conversely, the waveguides of Spinner may have been adapted to incorporate the third waveguide which would have provided the advantage of a straight thru connection as shown by Hettlage and Mayer, thus the claims remain anticipated by Spinner in view of Hettlage or Mayer and the rejections is/are maintained.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dean O. Takaoka whose telephone number is (571) 272-1772. The examiner can normally be reached on 8:30a - 5:00p Mon - Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Pascal can be reached on (571) 272-1769. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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May 20, 2007